III. REMARKS/ARGUMENTS

A. Status of the Application

Claims 1, 3, 13, 38, 43, 54 and 55 are amended. Claims 17 – 37 and 39 – 40 are cancelled. Claims 56 – 74 are added. Thus, claims 1 – 16, 38, and 41 – 74 are now pending.

None of the amendments to the claims nor the cancellation of claims was made in response to the present rejection.

The amendments to claims 1, 38, 43 and 54 are supported throughout the specification, for example, at paragraphs [0005], [0011], [0019] and Examples 1 – 2. The amendment to claim 3 corrects a typographical error. The amendment to claim 13 clarifies the nature of the stabilizing surfactant, and is supported throughout the specification, for example, at paragraphs [0009] and [0016]. The amendment to claim 55 is for consistency with the amendments to claim 43.

Reconsideration of this application in light of the following remarks is respectfully requested.

B. Restriction Requirement under 35 U.S.C. § 121

The Examiner has required restriction to one of the following inventions under 35 U.S.C. 121:

I. Claims 1 – 16 and 38 – 55, drawn to a method of cementing a subterranean zone.

II. Claims 17 – 37, drawn to a cement composition.

Applicants affirm the election of the invention of Group I, claims 1 – 16 and 38 – 55 for prosecution. Claims 17 – 37 are canceled herein without disclaimer or prejudice, as Applicants wish to preserve the opportunity to pursue the subject matter of claims 17 – 37 in a divisional application.

C. Objection to Abstract

The abstract of the disclosure stands objected to because the term "is provided" is stated in line 1, and because the last sentence recites purported merits. The abstract is amended herein to delete recitation of the term "is provided" in line 1, and the alleged recitation of purported

merits. Accordingly, Applicants respectfully request that the objection to the abstract be withdrawn.

D. Rejection of Claims 1 – 16 and 38 – 55 under 35 U.S.C. § 102(e) over Chatterji '867

Claims 1 – 16 and 38 – 55 stand rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,767,867 to Chatterji et al. ("Chatterji '867"). This rejection is respectfully traversed.

Claims 39 and 40 are cancelled herein for reasons unrelated to the present rejection. Of the remaining claims, claims 1, 38 and 43 are independent. Each of claims 2 – 16 depends directly or indirectly from claim 1. Each of claims 41 and 42 depends directly or indirectly from claim 38. Each of claims 44 – 55 depends directly or indirectly from claim 43.

As provided in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim ...". Chatterji '867 fails to meet the standard required under MPEP § 2131 because Chatterji '867 fails to disclose each and every element of claims 1, 38 and 43, and the claims dependent thereon.

1. Claims 1 – 16

As presented herein, claim 1 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement composition to set therein. The method further includes preparing the cement composition with a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

Each of claims 2 – 16 depends directly or indirectly from claim 1, and therefore each includes at least the foregoing elements.

In contrast, Chatterji '867 describes methods of treating subterranean zones with a treating fluid that includes a "water soluble polymer complex fluid loss control additive". (Abstract). The treating fluid may also include a hydraulic cement. (col. 3, line 60). The polymer complex fluid loss control additive is defined as "*a cationic, anionic or amphoteric*

polymer which is polymerized in the presence of a *nonionic host polymer*." (col. 4, lines 26 – 29) (emphasis added).

The nonionic host polymer described by Chatterji '867 is not used in its monomeric form, but rather must be a "previously prepared or natural polymer". (col. 3, lines 4 – 5). Thus, the nonionic host polymer described by Chatterji '867 could not be the equivalent of a polar enhancing monomer or an elasticity enhancing monomer as recited in claim 1.

The cationic, anionic or amphoteric polymer is formed in the presence of the nonionic host polymer from monomer units preferably derived from a sulfonic acid functional monomer. (col. 3, line 17). Other monomer units such as N,N-dimethylacrylamide, acrylamide, acrylic acid and vinylpyrrolidone can also be included with the sulfonic acid functional monomer. (col. 3, lines 24 – 25). Thus, the polymer complex fluid loss control additive described by Chatterji '867 consists of two distinct polymers – one is a pre-formed nonionic polymer, and the other is a polymer derived from sulfonic acid functional monomers. This complex is not a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer as recited in claim 1.

Moreover, the polymer complex fluid loss control additive described by Chatterji '867 operates to prevent loss of water from a treating fluid – while the treating fluid is still in its fluid form. The polymer complex fluid loss control additive is not designed to effect a treating fluid in its final state, such as a set cement composition. In contrast, the polymer emulsion recited in claim 1 includes a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of the *set* cement composition compared to a neat cement composition, while providing the *set* cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Chatterji '867 fails to teach each and every element of claim 1. Applicants further submit that Chatterji '867 fails to teach each and every element of claims 2 – 16 for at least the same reasons that apply to claim 1.

2. Claims 38, 41 and 42

As presented herein, claim 38 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement composition to set therein. The method further includes preparing the cement composition from

a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The method further requires that the polar monomer is selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid and acid, ester, amide or salt forms of acrylates, and the elasticity enhancing monomer is selected from the group consisting of ethylene, propylene, butadiene, and 1,3-hexadiene and isoprene. The method further requires that the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

As discussed above with respect to the rejection of claims 1 – 16 over Chatterji '867, the nonionic host polymer described by Chatterji '867 is not used in its monomeric form, but rather must be a "previously prepared or natural polymer". Thus, the nonionic host polymer could not be the equivalent of a polar enhancing monomer or an elasticity enhancing monomer as recited in claim 38.

Also as discussed above, the polymer complex fluid loss control additive described by Chatterji '867 consists of two distinct polymers – one is a pre-formed nonionic polymer, and the other is a polymer derived from sulfonic acid functional monomers. This complex is not a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer as recited in claim 38.

Moreover, Chatterji '867 fails to teach a polymer emulsion that includes a monomer selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid and acid, ester, amide or salt forms of acrylates, and a monomer selected from the group consisting of ethylene, propylene, butadiene, and 1,3-hexadiene and isoprene.

Finally, the polymer complex fluid loss control additive described by Chatterji '867 operates to prevent loss of water from a treating fluid in its fluid form. The polymer complex fluid loss control additive is not designed to increase the elasticity of the *set* cement composition compared to a neat cement composition, while providing the *set* cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Chatterji '867 fails to teach each and every element of claim 38. Applicants further submit that Chatterji '867 fails to teach each and every element of claims 41 and 42 for at least the same reasons that apply to claim 38.

3. Claims 43 – 55

As presented herein, claim 43 is drawn to a method for manipulating at least one mechanical property of a set cement composition. The claimed method includes preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The claimed method further includes allowing the cement composition to set, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone.

As discussed above with respect to the rejection of claims 1 – 16 over Chatterji '867, the polymer complex fluid loss control additive described by Chatterji '867 operates to prevent loss of water from a treating fluid – while the treating fluid is still in its fluid form. Chatterji '867 is devoid of a disclosure or suggestion of a method for manipulating at least one mechanical property of a *set* cement composition, as recited in claim 43.

Also as discussed above, the nonionic host polymer described by Chatterji '867 is not used in its monomeric form, but rather must be a "previously prepared or natural polymer". Thus, the nonionic host polymer could not be the equivalent of a polar enhancing monomer or an elasticity enhancing monomer as recited in claim 43.

Moreover, the polymer complex fluid loss control additive described by Chatterji '867 consists of two distinct polymers – one is a pre-formed nonionic polymer, and the other is a polymer derived from sulfonic acid functional monomers. This complex is not a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer as recited in claim 38.

In view of the foregoing, Applicants respectfully submit that Chatterji '867 fails to teach each and every element of claim 43. Applicants further submit that Chatterji '867 fails to teach each and every element of claims 44 – 55 for at least the same reasons that apply to claim 43.

B. Rejection of Claims 1 – 16 and 38 – 55 under 35 U.S.C. § 102(b) over Westerman

Claims 1 – 16 and 38 – 55 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,184,287 Westerman or EP 1024154. This rejection is respectfully traversed.

Claims 39 and 40 are cancelled herein for reasons unrelated to the present rejection. Of the remaining claims, claims 1, 38 and 43 are independent. Each of claims 2 – 16 depends directly or indirectly from claim 1. Each of claims 41 and 42 depends directly or indirectly from claim 38. Each of claims 44 – 55 depends directly or indirectly from claim 43.

Applicants note that U.S. Patent No. 6,184,287 is the priority application for EP 1024154, and that both name Ira John Westerman as inventor. The current Office Action does not delineate any substantive distinctions between the two references, and Applicants have found no substantive difference between the two relevant to claims 1 – 16 and 38 – 55. Accordingly, Applicants shall refer to these references collectively as "Westerman".

As provided in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim ...". Westerman fails to meet the standard required under MPEP § 2131 because Westerman fails to disclose each and every element of claims 1, 38 and 43, and the claims dependent thereon.

1. Claims 1 – 16

As presented herein, claim 1 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement composition to set therein. The method further includes preparing the cement composition with a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

Each of claims 2 – 16 depends directly or indirectly from claim 1, and therefore each includes at least the foregoing elements.

Westerman describes a method for minimizing gas channeling that occurs during the setting of a cement slurry. (col. 2, lines 40 – 45 and col. 3, lines 38 – 40). The method requires a polymeric latex that is prepared by aqueous emulsion polymerization of a monomeric mixture of styrene and butadiene in the presence of a seed polymer prepared by aqueous polymerization of styrene and a salt of 2-acrylamido-2-methylpropanesulfonic acid. (col. 3, lines 45 – 50).

The polymeric latex described by Westerman does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone. Although the butadiene in the polymer latex described by Westerman can be a considered an elasticity enhancing monomer, neither of styrene nor a salt 2-acrylamido-2-methylpropanesulfonic acid (which is properly classified as a sulfonate) could be considered a polar monomer.

In addition, the 2-acrylamido-2-methylpropanesulfonic acid described by Westerman is used in its polymeric, not monomeric form, (see col. 4, lines 17 – 25), and therefore could not be the equivalent of a polar enhancing monomer or an elasticity enhancing monomer as recited in claim 1. Even considering the butadiene in the polymeric latex described by Westerman as an elasticity enhancing monomer, the polymeric latex described by Westerman would still lack a polar monomer.

Moreover, the polymeric latex described by Westerman operates to prevent gas channeling and porosity through a cement composition *during* setting, and is not designed to effect a *set* cement composition. In contrast, the polymer emulsion recited in claim 1 includes a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of the *set* cement composition compared to a neat cement composition, while providing the *set* cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Westerman fails to teach each and every element of claim 1. Applicants further submit that Westerman fails to teach each and every element of claims 2 – 16 for at least the same reasons that apply to claim 1.

2. Claims 38, 41 and 42

As presented herein, claim 38 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement

composition to set therein. The method further includes preparing the cement composition from a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The method further requires that the polar monomer is selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid and acid, ester, amide or salt forms of acrylates, and the elasticity enhancing monomer is selected from the group consisting of ethylene, propylene, butadiene, and 1,3-hexadiene and isoprene. The method further requires that the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

As discussed above with respect to the rejection of claims 1 – 16 over Westerman, the polymeric latex described by Westerman does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone. Although the butadiene in the polymer latex described by Westerman can be a considered an elasticity enhancing monomer, neither of styrene nor a salt 2-acrylamido-2-methylpropanesulfonic acid (which is properly classified as a sulfonate) could be considered a polar monomer.

Moreover, Westerman fails to teach a polymer emulsion that includes a monomer selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid and acid, ester, amide or salt forms of acrylates, and a monomer selected from the group consisting of ethylene, propylene, butadiene, and 1,3-hexadiene and isoprene.

Further still, the polymeric latex described by Westerman operates to prevent gas channeling and porosity through a cement composition *during* setting, and is not designed to effect a *set* cement composition. In contrast, the polymer emulsion recited in claim 38 includes a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of the *set* cement composition compared to a neat cement composition, while providing the *set* cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Westerman fails to teach each and every element of claim 38. Applicants further submit that Westerman fails to teach each and every element of claims 41 and 42 for at least the same reasons that apply to claim 38.

3. Claims 43 – 55

As presented herein, claim 43 is drawn to a method for manipulating at least one mechanical property of a set cement composition. The claimed method includes preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The claimed method further includes allowing the cement composition to set, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone.

As discussed above with respect to the rejection of claims 1 – 16 over Westerman, the polymer latex described by Westerman operates to prevent gas channeling and porosity through a cement composition *during* setting, and is not designed to effect a *set* cement composition. In contrast, the polymer emulsion recited in claim 43 includes a polar monomer and an elasticity enhancing monomer in relative amounts effective to reduce the Young's modulus of the *set* cement composition compared to a neat cement composition, while providing the *set* cement composition with at least a compressive strength sufficient to seal the subterranean zone. Westerman is devoid of a disclosure or suggestion of a method for manipulating a mechanical property of a *set* cement composition, as recited in claim 43.

Moreover, the polymeric latex described by Westerman does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to reduce the Young's modulus of a set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal the subterranean zone. Although the butadiene in the polymer latex described by Westerman can be a considered an elasticity enhancing monomer, neither of styrene nor a salt 2-acrylamido-2-methylpropanesulfonic acid (which is properly classified as a sulfonate) could be considered a polar monomer.

In view of the foregoing, Applicants respectfully submit that Westerman fails to teach each and every element of claim 43. Applicants further submit that Westerman fails to teach each and every element of claims 44 – 55 for at least the same reasons that apply to claim 43.

F. Rejection of Claims 1 – 14 and 43 – 55 under 35 U.S.C. § 102(b) over Sabins

Claims 1 – 14 and 43 – 55 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,171,386 to Sabins ("Sabins"). This rejection is respectfully traversed.

Claims 1 and 43 are independent. Each of claims 2 – 16 depends directly or indirectly from claim 1. Each of claims 44 – 55 depends directly or indirectly from claim 43.

As provided in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim ...". Sabins fails to meet the standard required under MPEP § 2131 because Sabins fails to disclose each and every element of claims 1 and 43, and the claims dependent thereon.

1. Claims 1 – 16

As presented herein, claim 1 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement composition to set therein. The method further includes preparing the cement composition with a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

Each of claims 2 – 16 depends directly or indirectly from claim 1, and therefore each includes at least the foregoing elements.

In contrast, Sabins describes a method for cementing in a subterranean zone with a cement composition that includes about 10% to 50% by weight of cement of an interpolymer latex. (Abstract). The interpolymer latex includes three monomers: (1) a conjugated diene monomer having 4 to 8 carbon atoms; (2) a vinyl aromatic monomer having 8 to 12 carbon atoms; and (3) a copolymerizable functional monomer. (Abstract). The cement composition is

designed for stability at temperatures above 200°F, without the need for a stabilizer, and for preventing gas channeling, which is an event that can occur during setting of the cement composition. (col. 5, line 20).

According to Sabins, the conjugated diene monomer (1) can be 1, 3 butadiene, piperylene, isoprene or 2,3 dimethyl-1,3 butadiene. (col. 6, lines 14 – 15). The vinyl aromatic monomer (2) can be styrene, alpha methyl styrene, para tertiary butyl styrene, methyl vinyl toluene, para vinyl toluene and 3 ethyl styrene. The copolymerizable functional monomer (3) can be selected from one of the following four groups: (a) acrylic acid or methacrylic acid, in an amount of from about 1% to 10% by weight of the interpolymer latex; (b) a functional monomer having an activatable methyl, ethyl, propyl or butyl ester group, and a vinyl group, in an amount from about 1% to 15% by weight of the interpolymer latex; (c) 2-acrylamido-2 methylpropane-1-sulfonic acid, in an amount of from 1% to 50% by weight of the interpolymer latex; or (d) any of methyl acrylamidoglycolate; ethyl acrylamidoglycolate; butyl acrylamidoglycolate; methyl acrylamidoglycolate methyl ether; butyl acrylamidoglycolate butyl ether; methyl methacryloxyacetate; ethyl acrylamido-N-oxalate; N-N'-bis(ethyloxalyl)acrylamide; N-isopropyl, N-ethyloxalyl-N'-methyleneaminoacrylamide; ethyl N-2-ethyloxamatoacrylate; ethyl 3 pyruvylacrylate; ethyl methylene pyruvate; methyl acrylthiocarbonyloxyacetate; methyl thiacrylthioglycolate; methy acryl-2-thioglycolate; methyl thiacrylamidoacetate; methyl acrylamidoglycolate thioether; methyl acrylamido-N-methylenetioglycolate; and para-ethyl oxalyl styrene. (col. 5, line 39 – col. 6, line 18; and col. , lines 1 – 66).

The interpolymer latex described by Sabins does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone. Although the conjugated diene (1) in the interpolymer latex described by Sabins can be a considered an elasticity enhancing monomer, neither the vinyl aromatic monomer (2) nor the copolymerizable functional monomer (3) could be considered a polar monomer used in a method as recited in claim 1.

Further still, the interpolymer latex described by Sabins operates to prevent gas channeling in a cement composition *during* setting, and is not designed to effect a *set* cement composition. In contrast, the polymer emulsion recited in claim 1 includes a polar monomer and

an elasticity enhancing monomer in relative amounts effective to increase the elasticity of the *set* cement composition compared to a neat cement composition, while providing the *set* cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Sabins fails to teach each and every element of claim 1. Applicants further submit that Sabins fails to teach each and every element of claims 2 – 16 for at least the same reasons that apply to claim 1.

2. Claims 43 – 55

As presented herein, claim 43 is drawn to a method for manipulating at least one mechanical property of a set cement composition. The claimed method includes preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The claimed method further includes allowing the cement composition to set, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone.

The interpolymer latex described by Sabins does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to reduce the Young's modulus of a set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal the subterranean zone.

In addition, the interpolymer latex described by Sabins operates to prevent gas channeling through a cement composition *during* setting, and is not designed to effect a *set* cement composition. In contrast, the polymer emulsion recited in claim 43 includes a polar monomer and an elasticity enhancing monomer in relative amounts effective to reduce the Young's modulus of the *set* cement composition compared to a neat cement composition, while providing the *set* cement composition with at least a compressive strength sufficient to seal the subterranean zone. Sabins is devoid of a disclosure or suggestion of a method for manipulating at least one mechanical property of a *set* cement composition, as recited in claim 43.

In view of the foregoing, Applicants respectfully submit that Sabins fails to teach each and every element of claim 43. Applicants further submit that Sabins fails to teach each and every element of claims 44 – 55 for at least the same reasons that apply to claim 43.

G. Rejection of Claims 1 – 14 and 43 – 55 under 35 U.S.C. § 102(b) over Chatterji '844

Claims 1 – 14 and 43 – 55 stand rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,688,844 to Chatterji et al. ("Chatterji '844"). This rejection is respectfully traversed.

Claims 1 and 43 are independent. Each of claims 2 – 14 depends directly or indirectly from claim 1. Each of claims 44 – 55 depends directly or indirectly from claim 43.

As provided in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim ...". Chatterji '844 fails to meet the standard required under MPEP § 2131 because Chatterji '844 fails to disclose each and every element of claims 1 and 43, and the claims dependent thereon.

1. Claims 1 – 14

As presented herein, claim 1 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement composition to set therein. The method further includes preparing the cement composition with a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

Each of claims 2 – 14 depends directly or indirectly from claim 1, and therefore each includes at least the foregoing elements.

Chatterji '844 describes a cement composition consisting of cementitious material, an aqueous rubber latex, and a latex stabilizer, and methods for using same. (Abstract.) Suitable aqueous rubber latexes are natural rubber (cis-1,4-polyisoprene), styrene/butadiene rubber, cis-1,4-polybutadiene rubber and blends thereof, high styrene resin, butyl rubber, ethylene/propylene rubbers, neoprene rubber, nitrile rubber, cis-1,4-polyisoprene rubber, silicone rubber,

chlorosulfonated rubber, polyethylene rubber, epichlorohydrin rubber, fluorocarbon rubber, fluorosilicone rubber, polyurethane rubber, polyacrylic rubber and polysulfide rubber. (col. 4, lines 30 – 39).

The aqueous rubber latex described by Chatterji '844 does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone. Although the butadiene, ethylene or propylene constituent in the aqueous rubber latex described by Chatterji '844 can be a considered an elasticity enhancing monomer, none of the constituents described by Chatterji '844 could be considered a polar monomer.

Moreover, Chatterji '844 does not describe methods for cementing using a cement composition that includes a polymer emulsion having relative amounts of a polar monomer and an elasticity enhancing monomer effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Chatterji '844 fails to teach each and every element of claim 1. Applicants further submit that Chatterji '844 fails to teach each and every element of claims 2 – 14 for at least the same reasons that apply to claim 1.

2. Claims 43 – 55

As presented herein, claim 43 is drawn to a method for manipulating at least one mechanical property of a set cement composition. The claimed method includes preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The claimed method further includes allowing the cement composition to set, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone.

The aqueous rubber latex described by Chatterji '844 does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to reduce the

Young's modulus of a set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal the subterranean zone. Moreover, although the butadiene, ethylene or propylene constituent in the aqueous rubber latex described by Chatterji '844 can be a considered an elasticity enhancing monomer, none of the other constituents described by Chatterji '844 could be considered a polar monomer.

Further still, Chatterji '844 does not describe methods for cementing using a cement composition that includes a polymer emulsion having relative amounts of a polar monomer and an elasticity enhancing monomer effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone

In view of the foregoing, Applicants respectfully submit that Chatterji '844 fails to teach each and every element of claim 43. Applicants further submit that Chatterji '844 fails to teach each and every element of claims 44 – 55 for at least the same reasons that apply to claim 43.

H. Rejection of Claims 1 – 14 and 43 – 55 under 35 U.S.C. § 102(b) over Chatterji '924

Claims 1 – 14 and 43 – 55 stand rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,795,924 to Chatterji et al. ("Chatterji '924"). This rejection is respectfully traversed.

Claims 1 and 43 are independent. Each of claims 2 – 14 depends directly or indirectly from claim 1. Each of claims 44 – 55 depends directly or indirectly from claim 43.

As provided in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim ...". Chatterji '924 fails to meet the standard required under MPEP § 2131 because Chatterji '924 fails to disclose each and every element of claims 1 and 43, and the claims dependent thereon.

1. Claims 1 – 14

As presented herein, claim 1 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement composition to set therein. The method further includes preparing the cement composition with a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The polar monomer and the elasticity

enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

Each of claims 2 – 14 depends directly or indirectly from claim 1, and therefore each includes at least the foregoing elements.

Chatterji '924 describes a cement composition consisting of cementitious material, an aqueous rubber latex, and a latex stabilizer, and methods for using same. (Abstract.) Suitable aqueous rubber latexes are natural rubber (cis-1,4-polyisoprene), styrene/butadiene rubber, cis-1,4-polybutadiene rubber and blends thereof, high styrene resin, butyl rubber, ethylene/propylene rubbers, neoprene rubber, nitrile rubber, cis-1,4-polyisoprene rubber, silicone rubber, chlorosulfonated rubber, polyethylene rubber, epichlorohydrin rubber, fluorocarbon rubber, fluorosilicone rubber, polyurethane rubber, polyacrylic rubber and polysulfide rubber. (col. 4, lines 30 – 41).

The aqueous rubber latex described by Chatterji '924 does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone. Although the butadiene, ethylene or propylene constituent in the aqueous rubber latex described by Chatterji '924 can be a considered an elasticity enhancing monomer, none of the other constituents described by Chatterji '924 could be considered a polar monomer.

Moreover, Chatterji '924 does not describe methods for cementing using a cement composition that includes a polymer emulsion having relative amounts of a polar monomer and an elasticity enhancing monomer effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Chatterji '924 fails to teach each and every element of claim 1. Applicants further submit that Chatterji '924 fails to teach each and every element of claims 2 – 14 for at least the same reasons that apply to claim 1.

2. Claims 43 – 55

As presented herein, claim 43 is drawn to a method for manipulating at least one mechanical property of a set cement composition. The claimed method includes preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The claimed method further includes allowing the cement composition to set, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone.

The aqueous rubber latex described by Chatterji '924 does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to reduce the Young's modulus of a set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal the subterranean zone. Moreover, although the butadiene, ethylene or propylene constituent in the aqueous rubber latex described by Chatterji '924 can be a considered an elasticity enhancing monomer, none of the other constituents described by Chatterji '924 could be considered a polar monomer.

Moreover, Chatterji '924 does not describe methods for cementing using a cement composition that includes a polymer emulsion having relative amounts of a polar monomer and an elasticity enhancing monomer effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Chatterji '924 fails to teach each and every element of claim 43. Applicants further submit that Chatterji '924 fails to teach each and every element of claims 44 – 55 for at least the same reasons that apply to claim 43.

I. Rejection of Claims 1 – 14 and 43 – 55 under 35 U.S.C. § 102(b) over Vijn

Claims 1 – 14 and 43 – 55 stand rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,588,488 to Vijn et al. ("Vijn."). This rejection is respectfully traversed.

Claims 1 and 43 are independent. Each of claims 2 – 14 depends directly or indirectly from claim 1. Each of claims 44 – 55 depends directly or indirectly from claim 43.

As provided in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim ...". Vijn fails to meet the standard required under MPEP § 2131 because Vijn fails to disclose each and every element of claims 1 and 43, and the claims dependent thereon.

1. Claims 1 – 14

As presented herein, claim 1 is drawn to a method of sealing a subterranean zone that includes placing a cement composition into the subterranean zone, and allowing the cement composition to set therein. The method further includes preparing the cement composition with a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

Each of claims 2 – 14 depends directly or indirectly from claim 1, and therefore each includes at least the foregoing elements.

Vijn describes a cement composition consisting of hydraulic cement, a styrene/butadiene aqueous latex, and cementing additives, and methods for using same. (Abstract.) The styrene/butadiene aqueous rubber latex may also include a third monomer having a carboxylate, sulfate or sulfonate group. (col. 2, line 33).

The styrene/butadiene aqueous rubber latex described by Vijn does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone. Although the butadiene in the aqueous rubber latex described by Vijn can be a considered an elasticity enhancing monomer, neither the styrene nor the optional third monomers in the aqueous rubber latexes described by Vijn could be considered a polar monomer.

Moreover, Vijn does not describe methods for cementing using a cement composition made with a polymer emulsion that has relative amounts of a polar monomer and an elasticity enhancing monomer effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Vijn fails to teach each and every element of claim 1. Applicants further submit that Vijn fails to teach each and every element of claims 2 – 14 for at least the same reasons that apply to claim 1.

2. Claims 43 – 55

As presented herein, claim 43 is drawn to a method for manipulating at least one mechanical property of a set cement composition. The claimed method includes preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The claimed method further includes allowing the cement composition to set, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone.

The aqueous rubber latex described by Vijn does not include both a polar monomer and an elasticity enhancing monomer in relative amounts effective to reduce the Young's modulus of a set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal the subterranean zone. Moreover, although the butadiene in the aqueous rubber latex described by Vijn can be a considered an elasticity enhancing monomer, neither the styrene nor the optional third monomers in the aqueous rubber latexes described by Vijn could be considered a polar monomer.

Further still, Vijn does not describe methods for cementing using a cement composition made with a polymer emulsion that has relative amounts of a polar monomer and an elasticity enhancing monomer effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that Vijn fails to teach each and every element of claim 43. Applicants further submit that Vijn fails to teach each and every element of claims 44 – 55 for at least the same reasons that apply to claim 43.

J. New Claims 56 – 65

New claim 56 is drawn to a method of sealing a subterranean zone that includes preparing a cement composition comprising a cementitious material, a polymer emulsion, and a mixing fluid, placing the cement composition into the subterranean zone, and allowing the cement composition to set therein.

According to claim 56, the polymer emulsion comprises at least one polar monomer selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, and acid, ester, amide or salt forms of acrylates, and at least one elasticity enhancing monomer. In addition, the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

As discussed above, none of the art of record discloses or suggests a method of sealing a subterranean zone that with a cement composition that includes a polymer emulsion comprising at least one polar monomer selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, and acid, ester, amide or salt forms of acrylates and at least one elasticity enhancing monomer.

In addition, none of the art record discloses or suggests a polymer emulsion wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that claim 55 is allowable over the art of record. Further, each of new claims 57 – 65 depends directly or indirectly from claim 56, and therefore each includes is allowable over the art of record for at least the same reasons that apply to claim 55.

K. New Claims 66 – 74

New claim 66 is drawn to a method of sealing a subterranean zone that includes preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid. The method further includes placing the cement composition into a subterranean zone, and allowing the cement composition to set therein.

According to the method of claim 66, the polymer emulsion is present in an amount of from about 0.1 to about 30 percent by weight of the cementitious material. Further, the polymer emulsion comprises from about 1 to about 90 weight percent of the at least one polar monomer and from about 10 to about 99 weight percent of the at least one elasticity enhancing monomer. Further still, the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

As discussed above, none of the art of record discloses or suggests a method of sealing a subterranean zone with a cement composition that includes a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer.

In addition, none of the art of record discloses or suggests a method of sealing a subterranean zone with a cement composition that includes a polymer emulsion in an amount of from about 0.1 to about 30 percent by weight of the cementitious material, where the polymer emulsion comprises at least one polar monomer and at least one elasticity enhancing monomer.

Further, none of the art of record discloses or suggests a method of sealing a subterranean zone with a cement composition that includes a polymer emulsion comprising at least one polar monomer, present in an amount of from about 1 to about 90 weight percent, and at least one elasticity enhancing monomer, present in an amount of from about 10 to about 99 weight percent of the at least one elasticity enhancing monomer.

Further still, none of the art record discloses or suggests a method of sealing a subterranean zone with a cement composition that includes a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, wherein the polar monomer and the elasticity enhancing monomer are present in relative amounts effective to

increase the elasticity of a set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

In view of the foregoing, Applicants respectfully submit that claim 66 is allowable over the art of record. Further, each of new claims 67 – 74 depends directly or indirectly from claim 66, and therefore each includes is allowable over the art of record for at least the same reasons that apply to claim 66.

Conclusion

Claims 1 – 16, 38, and 41 – 74 are now pending in the present application. In view of the foregoing remarks, allowance of claims 1 – 16, 38, and 41 – 74 is respectfully requested. The examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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